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IBM STARS REPOSITORY USER'S GUIDE

May 10, 1990

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13. ABSTRACT (Maximum 200 words) A guide to software reuse using the STARS Repository. This document contains the IBM STARS Repository Guidebook, STARS Repository User's Guide, and STARS Reusability Guidelines. Each is described below. IBM STARS Repository Guidebook. A guide to the STARS Repository, providing high-level information for all users -- component reusers, component suppliers, and repository administrators. The Guidebook is organized according to the specific roles that users perform when using the system. STARS Repository User's Guide. A guide on how to access and use the STARS Repository. It provides the basic information needed to use the repository software, but it is not a comprehensive guide to the VAX computer, on which the repository is built. STARS Reusability Guidelines. A set of Ada coding guidelines for component development that emphasize reusability. Code that follows these guidelines will be easier to reuse on multiple projects and platforms. Many examples are provided illustrating		
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Accession For	
NTIS CRASH	<input checked="" type="checkbox"/>
DTIC TAB	<input type="checkbox"/>
Unattached	<input type="checkbox"/>
Justification	
By <i>per letter</i>	
Distribution/	
Availability Codes	
Dist	1/1 and/or Special
A-1	

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Repository User's Guide

DRAFT

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Prepared for:

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1. User Authorization Procedure

The Software Technology for Adaptable Reliable Systems (STARS) program has contracted for the operation of a repository of all deliverable software, technical reports, and collected software. The repository also operates as medium of interchange between the prime contractors, the subcontractors, the consultants, and the contracting agency. Electronic mail is interchanged, other electronic documents are shared, software is developed, and software is shared and reused by the STARS contract participants with the STARS repository computer.

Any contractor or agency directly involved with the STARS program may request an account on the IBM Team STARS Repository. The policies and procedures governing use of the system are documented in the Repository Policies and Procedures [IBM1460] and the Repository Operations and Procedures [IBM1470] documents. A request form is in the appendix and once completed it should be mailed to:

Science Applications International Corporation
Ada Software Division
311 Park Place Blvd.
Suite 360
Clearwater, Florida, 34619

The processing time is 3-4 days for user verification and account creation after receipt. Forms may also be FAXed to (813)797-3187.

New users will be notified of their user identification and a password. User identifications are for a single individual and are not to be shared. Initially assigned passwords must be changed by the user at their first session (see Logging On To The Repository, section 2.2).

NOTE: Do not reveal your password to anyone. Sharing STARS accounts with others is cause for termination of access privileges.

This document provides information on accessing and using the STARS Repository. It provides the basic information needed to use repository software, it is not a comprehensive introduction to using the VAX computer upon which the repository is built.

This document will be revised as the repository software changes and as indicated by user feedback. Please direct your comments and suggestions to username 'REPOS' via electronic mail on the STARS computer.

2. STARS Access

User access to the Repository is via dial-up modems into a terminal server which provides automatic connection to the Repository computer. Network access may become available in the future. There are currently eighteen telephone lines organized in a rotary group. Sixteen of these eighteen lines are connected to 2400-bps modems equipped with MNP Level 5 error correction and compression. The remaining two lines are connected to 9600-bps V.32 modems equipped with MNP Level 6 error correction and compression.

The phone number for the STARS computer is (813)791-7222. The STARS computer can also be reached by dialing 1-800-STARS10 (1-800-782-7710). The two 9600 bits per second (bps) Multitech V.32 modems may be reached by the phone numbers (813)791-0535 and (813)791-9530.

2.1 Required Equipment

The STARS computer may be accessed and used by any equipment which can transmit and receive the American Standard Code for Information Interchange (ASCII) over the dial-up telephone network using Bell 212A or CCITT V.22bis compatible modems. In reality what you need is a 1200 or 2400 bps modem and a terminal or computer which can emulate a DEC VT100 or a DEC VT220 terminal. Software which supports the KERMIT or XMODEM file transfer protocols are available and will prove useful. The STARS computer is regularly used by Apple Macintosh computers using software such as Red Ryder 10.3 and IBM computers using software such as PROCOMM or FTTERM. FTTERM offers emulation of the VT220 terminal and therefore allows PC users improved access to VAX software.

NOTE: Some modem programs offer better terminal emulation than others and users are cautioned that many problems in using the STARS computer are due to poor software emulation of the VT100 terminal or its keyboard. The mapping of the VT100 keypad to the PC keyboard with PROCOMM can be confusing to users accustomed to the VT100 keypad.

2.2 Logging On To The Repository

Modem users should dial (813) 791-7222 by whatever means are offered by their terminal hardware and software. The connection can be made at 1200 or 2400 bps, no parity, 8 data bits, and 1 stop bit. Enter a {Return} character once about every 2 seconds to allow the DecServer 500 to determine the terminal bps rate and display its prompt:

DecServer 500 Terminal Server V1.0 - LAT V5.1

Please Type HELP if you need assistance

Enter username> _

At the DecServer prompt, enter your login ID or your initials and press {Return} . You will be connected to the STARS computer automatically.

NOTE: If the prompt Local> appears, enter Connect STARS and press {Return} to access the Repository computer. The DecServer 500 uses the line break signal as a means to access some of its advanced features, if a break signal is sent during a session and the Local> prompt is displayed you may return to your STARS session by typing

resume{Return} .

The following announcement from the STARS computer will be displayed on your terminal or computer screen:

IBM TEAM STARS REPOSITORY

For system security, passwords are expired after 90 days of inactivity.

If you experience any problems, please call the help line.
(813) 791-9437

Username: _

At the Repository username prompt, enter your assigned username and {Return} at the password prompt, enter your password and {Return}. (Password will not echo.)

NOTE: A username is generated from a last name and catenating the initial of the first name.

Ex. Jim Smith
Username - SMITHJ

If the connection is completed and all prompts answered appropriately, the Repository news text will be displayed. The following is an example of a session startup news text:

IBM STARS Team VAX 3600, VMS V4.7A

===== Last Edited Thursday 15 February 1990 at 0845 EST =====
The IBM STARS Team IR40 Repository interface version 2.3 may be accessed via
the following command at the VMS prompt:

```
$ repos
-- Enhanced component search capability
-- STARS user locator now uses the database
-- Supply Process is available to add components to the repository
-- New 'Suggestion Box', entries are welcomed and encouraged
-- Supports menu access to both NEWS and NOTES
-- Supports VT100 terminals and emulators

===== IBM STARS Team Help phone line (813)791-9437 =====
Type NEWS at the VMS prompt to enter the ANU News 5.8 Bulletin Board.
===== For assistance call Len Turton or Steve Kutoroff =====
===== Problem Reports may be mailed to 'REPOS' =====
```

At the completion of this display there will be a delay while a large number of startup commands are processed. These commands prepare a command environment in which a number of repository tools become available from the command line. The standard VMS prompt for command entry is "\$ ", it may be changed with the command "SET PROMPT" as shown below:

```
$ Set prompt=">>"  
>>_
```

Which has changed the prompt string from "\$ " to ">>".

When you are first given your user i.d., a default system password will be assigned to you. This password should be changed by issuing the SET PASSWORD command. The system will prompt you to enter your old password. You should type in the old password. Please note that the password will not be displayed on the terminal. Press the {Return} key after you have entered the old password. You will then be prompted to enter a new password. Again, the password will not be displayed. Remember to press {Return} after you have entered the password. Note: The system requires passwords to be a minimum of 6 characters (Letters, Numbers, or a \$) beginning with a letter. After you have the new password, the system will print Verification: , you will then need to type in the new password again. The system will check the "verification password" against the "newpassword" and make sure they match before resetting your password. If the "verification password" and the "new password" do not match, the system will report an error on the verification and your password will NOT have changed. The following is what you will see on the terminal when you change your password:

```
$ set password  
Old Password: <enter your current password>  
New Password: <enter the password you want to use>  
Verification: <enter the new password again to confirm typing>  
$ _
```

Answer each prompt from the computer to change your password.

No one, not even the system manager can determine another person's password, except by guessing, a process that is not only inefficient but will cause alarms to be displayed on the system console. The system managers can change a password, and should be called if a password is forgotten or if more than 90 days elapse between access to the computer at which time passwords are expired by the computer. Similarly, just before the expiration date, the computer will display a message that ones password is expiring and it must be changed.

If at any time you have a problem while on the Repository, please document it and mail the information to the user 'REPOS'. The mail program is described in Appendix D of this document. The problem will be examined and you will be notified of the findings of the repository staff. Also note that the Repository has a problem reporting system. It allows the user to enter problems encountered on the system. It will automatically notify the Repository of the problem.

2.3 Logging Off The STARS Computer

To logout from the VMS command prompt one merely types LOG{Return} . At the DecServer prompt (Local>), enter LOG{Return} to drop the dial-in connection

2.4 Getting On-Line Help

To get help on a VMS command or a list of VMS commands and help topics, just type HELP{Return} or HELP topic{Return} at the VMS prompt. The help system provides on-line

information about each VMS command including examples of the command's use. The optional topic may be used to specify information to any level, for example:

```
$ help set password
```

will provide information on using the set password command. One could type HELP SET{Return} to get a list of possible options with the SET command.

All VMS products that have their own command language, such as the Ada compiler system, mail, and the configuration management system have a help command that provides the same information as help at the VMS prompt.

3. Using The STARS Computer

There are two forms of access to the repository, using VAX commands and software in an interactive fashion and accessing the STARS repository database interface. The database is documented in the following section.

Using Digital Command Language (DCL) allows for access to files, tools, and all the development software on the system. It requires learning a number of VAX commands and a good deal about how files are organized and referenced on the STARS system. It will also require learning one of the VAX editors: EDT, TPU, LSE, EMACS, or the STARS Editor (SE).

Using the repository interface is much easier. This interface is menu driven and it provides paths to enter many of the tools and software normally accessed via DCL commands. This is the preferred access method to repository contents as it will always represent the most current thinking on repository organization and reuse methods. The repository interface is entered with the command REPOS {Return} . Accessing information through the database provides you with additional information supplied by users of the products and a filtered and organized view of the repository contents. The menu system uses a product called the file browser as a screen oriented means of reading files which have been located using the database. The alternative is to use the DCL command language to access files by traversing the directory structure of the STARS computer, a method which provides no supporting information on repository components except that contained in the files themselves. The root directory of the STARS repository is set with the command set def Ada\$:[Repository] .

The remainder of this section shall describe frequently used VMS commands. Other commands or programs available on the STARS Repository will be described in the appendix or in other sections. The repository software will be described in a latter section. The most commonly used commands and programs that will be described are:

VAX Command	DOS equiv	UNIX equiv	Notes
DIR	DIR	ls	
COPY	COPY	cp	
RENAME	RENAME		
TYPE	TYPE	cat	
TYPE/PAGE	TYPE MORE	more	
SET DEF	CD	cd	
SHOW USER		who	
MAIL			see appendix D
Ada			see appendix A
KERMIT			see appendix C
AdaMat			see appendix E
NEWS			see appendix F
SGML			see appendix G
Browse			STARS file browser
CAS			Count Ada Statements
Check_Standards			
COCOMO			COConstructive COst Model
Compile_Order			
Pretty_Print			
Statement_Profile			

3.1 The Directory (DIR) Command

In a manner similar to Unix and MS-DOS, VMS has the concept of a current working directory. Upon logging onto the computer one is placed in the account's user directory. This directory has the same name as the users identification and resides on a disk with the logical name DISK\$USER:. The full name for a user directory is then DISK\$USER:[username] in VMS. To list the files a working directory one uses the directory command, which is often abbreviated "DIR".

The DIRECTORY command lists the names of files in a particular directory, and includes the file names, file types and version numbers of each file. In addition, you will be given the disk and directory name, as well as the total number of files in the directory.

\$ DIR	listing in alphabetic sequence
\$ DIR/SIZE	displays size of each file
\$ DIR/SECURITY	displays owner and protection of files
\$ DIR/DATE	displays date file created
\$ DIR/FULL	displays full information on files
\$ DIR Filename	displays all files with name Filename

Note: Certain Qualifiers, like /SIZE and /SECURITY, can be used together to make a command DIR/SIZE/SECURITY.

Symbols allow you to tailor the command language by defining your own DCL commands, or changing existing ones. Symbols affect your process only, and are not saved when you log off the system. To make a symbol active each time you log in, store the symbol assignment in your LOGIN.COM file, located in your default directory.

Symbols must:

1. begin with the letters A-Z, or \$,
2. can contain numbers,
3. can be in upper or lower case, and
4. can contain 1-255 characters.

For example, if user SMITHJ wishes to define the symbol US to equal the command SHOW USERS , he would type:

```
$ US:== SHOW USERS
```

From then on (until he logs off the system), the symbol US will be active. To execute the SHOW USERS command, you need now only enter the command: US{Return} .

File names under VMS consist of two parts (as in MS-DOS), a filename and a file extension (or type) separated by a period, as in MS-DOS. A filename may contain one to 39 characters chosen from the letters A..Z, the digits 0..9, and the the special characters "_" and "\$".

The file type may contain zero to 39 letters and numbers. Many file types are recognized by VMS as having a special meaning, the most common of these are:

```
COM    -- Command procedure (BAT in MS-DOS)
DAT    -- Data file
DIS    -- MAIL distribution lists
EXE    -- Executable image file
JOU    -- Journal file produced by the EDT editor
LIS    -- Output listing file, as from compiler, etc.
MAI    -- Mail message file
ADA    -- Ada source code
DIR    -- Directory or Subdirectory file
```

Three character file types are the most common in VMS; however, up to 39 characters are allowed as noted above.

Every file has a version number to distinguish it from other copies of the file. It is the last item in a file specification, preceded by a semicolon (;). The system automatically assigns the version number 1 to a file that is newly created. Each time you edit the file and save it, the version number is incremented by 1. If you refer to a file without specifying the exact version number (with or without a semicolon or period), the most recent version will be accessed.

This feature allows the retrieval of previous versions of a file should a mistake be made. It also can allow for a large amount of disk space to be consumed by copies of the same information created at different times. The command `purge{Return}` deletes all lower versions of a file or files. VMS contains numerous features for managing files, the DEC manual "Introduction to VAX/VMS" (Order Number AA-Y500A-TE) should be referenced for additional information.

3.2 COPYING FILES

Use the `COPY` command to make copies of files, specifying first the name of the input file you want to copy, and second the name of the output file. If the name of the output file already exists, a new version of that file is created. To copy a file (TEMP.DAT) from the default directory to a subdirectory [SMITHJ.JUNK] with a new name, type:

```
$ COPY TEMP.DAT [SMITHJ.JUNK]TEMP1.DAT
```

When copying files from another user's directory to your own directory, you will want to make sure that file accessibility and integrity is maintained (i.e., proper protection rights, accounting information, etc.). To do so, issue the copy command from the directory that you wish the copied file to reside in. (Note: you must have appropriate read rights to the source directory that you will be copying from!)

In the following example, SMITHJ wishes to copy file JUNK.DAT from DOE's directory, and rename it TEMP.DAT. To do so, SMITHJ logs in to his account and issues the following command:

```
$ COPY [DOE]JUNK.DAT TEMP.DAT
```

3.3 RENAMING FILES

To change the name of a file, use the `RENAME` command specifying first the name of the file to be changed and second the new file name. Only the most recent version of that file name will be changed. Use wildcard characters to change all versions of a file name, or to change a number of files with a common file name or file type.

```
$ RENAME OLDFILE.NAME NEWFILE.NAME
```

3.4 TYPE and TYPE/PAGE

File contents may be viewed on the terminal screen with the command `TYPE`. For large files the command may be used with the switch `"/PAGE"` to pause the display at each full screen. The display of the file may be continued with the `{Return}` key or aborted with a `{control-Y}`

3.5 Changing Default Directories

To use another directory or subdirectory as your default directory, use the `SET DEFAULT` or `SD` commands. To see the current directory, use the command `SHOW DEFAULT`. For example, if you are in the directory `SMITHJ` and wish to attach to the subdirectory `JUNK` to do some editing, type:

```
$ SET DEFAULT [SMITHJ.JUNK]
      or
$ SD SMITHJ.JUNK
```

NOTE: `SD` is a non-standard VMS command. That is, we have the `SD` on STARS, but it may not be on other VAX computers. `SD` is used because it warns the user when trying to change the default directory to a directory that does not exist or that the user does not have access to. `SET DEFAULT` does NOT warn the user of such cases.

To see the current directory, use the command `SHOW DEFAULT`. In VMS a directory name is enclosed in square brackets and each directory name in a path is separated by periods, for example `"[REPOSITORY.STARS_PRIME.IBM]"`. Letter case is not significant in commands or filenames under VMS. Device names or their logical equivalence precedes the directory name to fully declare the location of a file, for example `"Ada$:[REPOSITORY.STARS_PRIME.IBM]"`.

Directories may also be specified relatively. To move from `"[REPOSITORY.STARS_PRIME]"` to the next lower level directory named `IBM` in the example above, one could enter `SET DEF [.IBM]`. The character `"."` is used to move up one level in directory path, so that one can move to another directory at the same level with the command `SET DEF [-.ORIENTATION_WORKSHOP]`.

3.6 SHOW USER

This command may be used to see what other users are currently using the STARS Repository computer. There are many options to the SHOW command, help may be used for more information.

4. Menu Interface

The menu based database interface was developed under task IR40 using components from STARS Foundations, IQ8, and other sources. The database uses the Oracle Corporation Oracle Relational Database Management System (RDBMS), the Structured Query Language (SQL), and Oracle's Ada interface product Pro*Ada to provide access to repository files. The following is a description of version 2.3 of the interface.

Each menu is composed of several options including "EXIT" and "HELP" options. Each option may be selected by moving the highlight bar to the option of interest (using the up and down arrow keys) and pressing {Return} . A second means of selecting an option is to simply type the highlighted letter in the option of interest. Using the highlighted letter to select commands does not require entering {Return} .

Several of the options offer submenus. Return to the next higher level of the menu system is always accomplished by typing "X" or moving the highlight bar to "EXIT" and entering {Return} . Other commands bring you to specialized screens which are used to enter queries to the database.

The Repository menu is displayed after typing the command REPOS{Return} at the DCL command prompt. The message displayed after successful logon will always announce the latest version of the repository menu access software and any limitations on its use. This menu offers the following options:

- o Component Search
- o Directory Search
- o Component Supply
- o Browse Current Catalog
- o Repository Tools
- o Repository Services
- o Suggestion Box
- o Problem Reporting
- o Help
- o Exit

4.1 Component Search

The component search menu is used to locate an asset stored in the organized repository database. The menu item brings up a sequence of specialized database access screens.

4.2 Directory Search

This menu item is used to browse the repository disk files directly. It uses a program called the directory browser prepared by Boeing under the STARS contract. The directory browser allows movement through the directory tree and viewing files without any need to use VAX/VMS commands. The directory browser uses numbered menu lists for selection and enters the SAIC file browser to view text files.

4.3 Component Supply

The component supply allows the user to search the repository for asset or component.

4.4 Browse Current Catalog

The browse current catalog allows the user to review the assets and components available in the repository.

4.5 Repository Tools

This menu item is used to select between a number of tools and programs available on the repository. Each of these programs is available from the command line as well as through this menu. The items offered in this menu are:

- o Ada Development Tools
- o Run SGML Parser
- o File Browser
- o Add A Person
- o Add An Organization
- o Problem Reporting
- o Help
- o Exit

4.5.1 Ada Development Tools

The Ada Development menu allows selection of commercial products such as the VAX Language Sensitive Editor and Ada Compiler, as well as products from the Ada repository, such as the lines counter and statement profiler. The following sub-menu is available under the Ada Development menu.

- o AdaMat
- o Edit Ada Source Code
- o Format Ada Source Code
- o Check Ada Style
- o Count Ada Statements
- o Profile Ada Statements
- o Generate Compile Order
- o Problem Reporting
- o Help
- o Exit

4.5.1.1 AdaMat

This menu item enters the AdaMat utility. For use of AdaMat refer to appendix E.

4.5.1.2 Edit Ada Source Code

This menu item enters the VAX/VMS Language Sensitive Editor after prompting for the file to be edited.

4.5.1.3 Format Ada Source Code

This menu item enters the Pretty Printer and will prompt for the file name of the Ada program to be reformatted. This program is a version of the NOSC tools program.

4.5.1.4 Check Ada Style

This menu item enters the Standards Checker program and will prompt for the file name of the Ada program to be checked.

4.5.1.5 Count Ada Statements

This menu item enters a program to count Ada statements, it will prompt for the input file to be processed.

4.5.1.6 Profile Ada Statements

This menu item enters the Statement Profiler tool after prompting for a file to be processed.

4.5.1.7 Generate Compile Order

This menu item enters the compile order tool.

4.5.1.8 Problem Reporting

This menu item is used to enter a problem report for the menu interface, the repository content, or an operational problem with the repository. The following menu is displayed for this item:

- Report a Problem
- Answer a Problem
- Review All Problem Reports
- Help
- Exit

4.5.1.9 Help

This menu entry is used to display a help screen using the browser.

4.5.2 Run SGML Parser

The option prompts for the name of a file to process with the STCS SGML parser. Information on the STCS SGML parser and the Datalogics SGML parser is available in Appendix G.

4.5.3 File Browser

This menu item enters the File Browser tool. This tool is used to examine files in full

screen mode.

4.5.4 Add a Person

This menu item is only used by the Reppositorian to manage the people search database.

4.5.5 Add an Organization

This menu item is only used by the Reppositorian to manage the Organizational database.

4.6 Repository Services

This menu item is used to select from a number of services available to repository users. Some of these services are available from the VMS prompt and others are unique to the repository.

- o Repository Information
- o Use Mail Facility
- o Use News Facility
- o Use Notes Facility
- o People Search
- o Review Usage Statistics
- o Generate Component Catalog
- o Review Component Catalog
- o Problem Reporting
- o Help
- o Exit

4.6.1 Repository Information

This menu displays a list of information subjects which provide information on various aspects of the repository database and its organization. Selecting one of these items places the user in the file browser reviewing the selected information.

- o General Information
- o Review Reusability Guidelines
- o Review Facet Terms
- o Review Taxonomy
- o Review Component Types
- o Review Part Types
- o Problem Reporting
- o Help
- o Exit

4.6.2 Use Mail Facility

This menu item enters the VAX/VMS mail facility for sending messages to users on the

STARS computer and other other computers connected to it through the network. The mail facility is described in Appendix D.

4.6.3 Use News Facility

This menu item enters the VAX/VMS News facility for exchanging ideas and helpful information for all users to view. The news facility is described in Appendix F.

4.6.4 Use Notes Facility

This menu item enters the VAX/VMS Notes facility for holding conferences on various topics. The notes facility is described in Appendix B.

4.6.5 People Search

This menu item supports finding names, addresses, STARS usernames, and phone numbers of participants in the STARS program.

4.6.6 Review Usage Statistics

This menu item is used to review the usage statistics on the STARS computer for the previous month. The previous months usage file is viewed using the file browser tool.

4.6.7 Generate Component Catalog

This menu item is used to generate a current catalog of all assets in the repository. The catalog is generated from the organized database using the SGML processing software to format the result.

4.6.8 Review Component Catalog

This menu item uses the file browser to view a component catalog.

4.6.9 Problem Reporting

This menu item is used to enter a problem report for the menu interface, the repository content, or an operational problem with the repository.

4.6.10 Help

This menu entry is used to display a help screen using the browser.

4.7 Suggestion Box

This menu entry is used to enter, review, or answer suggestions on the operation of the STARS Repository.

4.8 Problem Reporting

This menu item is used to enter a problem report for the menu interface, the repository content, or an operational problem with the repository.

4.9 Help

This menu entry is used to display a help screen using the browser.

4.10 Exit

This menu item will return to the command line interface from the menu interface.

5. Repository Tools

A number of Ada based tools are available on the repository for use during software development. These tools are written in Ada and have been collected and updated as required, source code is available as is the original and modified documentation. These tools may be found in the directory Ada\$:[Repository.Installed_Tools] where they have been collected. These tools are also available in the STARS deliverable area under IBM tasks Q10 and Q13.

5.1 Count Ada Statements (CAS)

This tool was written by Col. Whitaker and is a standard for measuring the number of lines and Ada statements in a source file. It may be executed from the command line using the command `CAS{Return}` , it will prompt for a filename to be processed. A file with a list of filenames may be provided by preceding the list filename with a "@" character. The program terminates when a blank filename is entered.

Source code and documentation are in Ada\$:[Repository.Installed_Tools.CAS].

5.2 Check_Standards

This tool was written by the Naval Ocean Systems Command as part of the Software Development and Maintenance Environment (SDME) toolset, it is used to compare Ada source code to standards which are derived from the Ada Language Reference manual. The program was initially written in 1985 but has been modified by SAIC under task IQ10 in 1989. It is executed by typing `Check_Standards{Return}` at the command line. Source code and documentation may be found in Ada\$:[Repository.STARS_Prime.IBM.Q10.C0430.Check].

5.3 COCOMO

The COCOMO program is one that has been converted to a standalone program from the SDME toolset by SAIC under task IQ10. The SDME version of COCOMO was written by M. K. McNair of the Ford Aerospace and Communications Corporation in March of 1985. The STARS version is screen menu oriented for user entry of input values. This program may be used to compute cost values for a software project using the Constructive Cost Model developed by Barry Boehm. Please refer to "Software Engineering Economics", Barry Boehm, Prentice-Hall, Englewood Cliffs, NJ, (c) 1981.

6. STARS Repository Technical Description

6.1 Central Processor

The Repository computer system is a Digital Equipment Corporation (DEC) microVAX model 3600 with 32 megabytes of main memory. The VAX line of computers from DEC offers extended virtual memory addressing and software compatibility across a wide performance range of CPU platforms from approximately one MIPS up to 30 MIPS. The model 3600 is rated at 2.7 MIPS, it may be upgraded to a performance level of 3.8 MIPS with a change of CPU boards.

6.2 Disk Storage

The repository computer is equipped with four DEC RA82 disk drives, each of 625 megabyte capacity. One RA82 is used exclusively for the operating system and its software support. This disk also contains the page and swap files used by the virtual memory operation of the machine. The compilers, debuggers, editors, database, and documentation software reside on this disk.

A separate RA82 is used to house the user files and working storage for software development. This disk drive has the logical name "Disk\$User:", each user is allocated a unique working area for their own files on this disk drive. User files are contained in a directory whose name is the same as the assigned username for computer access. The convention for STARS users is to assign a username which is their last name plus their first initial.

The remaining two RA82 disk drives are used to house the Ada software repository. The Ada software repository consists of a directory tree and a relational database of the collected Ada source code and deliverables from the contracts. The preferred access method to the repository is the database; however, there are materials in the file system which are not in the database. The two physically separate disk drives have been bound as one volume set giving the repository the equivalent capacity of a single 1.25 Gigabyte disk drive.

6.3 Communications

The only serial communication device connected to the VAX 3600 is the console terminal used for system control. All serial devices such as user terminals, modems, and printers are connected to the VAX 3600 via a DECSERVER 500 terminal server. The DECSERVER is a computer and communication interface system which concentrates the serial data and communicates to the VAX 3600 via an Ethernet local area network (LAN). The DECSERVER is programmed upon startup by one of the computers in the VAX cluster to which it is connected. The programming configures the DECSERVER ports and sets preferred services for each port. The ports which are connected to the STARS modems have a preferred service to connect to the STARS computer. The DECSERVER will prompt for a username upon making connection to the STARS computer. The DECSERVER does not verify the name entered, it is recommended that users enter their account username or their initials at this prompt so the system operator can identify the modem line they are using should a problem be encountered.

The modems for the STARS system are all supplied by Multitech. There are eighteen 2400 bps MNP level 5.0 modem cards in two Multitech CC216 Modem Rack chassis. These modems are available by dialing (813)791-7222, the pilot number for the eighteen line rotary connection. The STARS computer can also be reached by dialing 1-800-STARS10 (1-800-782-7710). Additionally, there are two Multitech V.32 modems capable of dial-up speeds to 9600 bps. These two modems are available as the last two numbers in the rotary group, phone numbers

(813)791-0535 and (813)791-9530.

STARS users may dial (813)791-9437 for assistance with accounts, logging onto the computer, or for help in locating products on the repository.

6.4 Peripherals

The STARS VAX 3600 also has a DEC model TU81-Plus 9-track industry compatible tape drive capable of 1600 bpi and 6250 bpi operation, a DEC LN03R Postscript Laser printer, and a DEC proprietary cartridge tape unit for loading software called a TK70. The TU81-Plus is used for backup and file exchange with the other prime contractors.

APPENDIX A.

APPENDIX: Ada Compiler System

The DEC Ada Compiler System (ACS) may be entered by typing the command ACS{Return}. This will place the user in the ACS command environment with the prompt "ACS>". Alternatively, ACS commands may be entered from the command line by preceding the command with ACS as in the following command examples:

```
$ ACS HELP
$ ACS CREATE LIB directory_name_for_library
$ ACS SET LIB directory_name_for_library
$ ACS SHOW LIB
$ ACS DIR
$ ACS RECOMPILE unit_name
$ ACS LINK main_procedure_name
```

Ada compiles may be executed without entering the ACS system or using the ACS command prefix simply by using the command ADA 'filename'{Return}'. In order to use the DEC Ada Compiler, an ADALIB must be defined. This need only be done once for each login session.

To define an Ada library type:

```
$ ACS CREATE LIBRARY [username.ADALIB]
-- where 'username' is the name used in the Repository logon
  or just [.adalib] if you are in your working directory.
  The Ada library need not be named ADALIB, it is a convention
  used in this document and by most users of the DEC Ada compiler.
```

If the ADALIB has previously been created, ACS will display a message.

The next step is to tell ACS which library to use:

```
$ ACS SET LIBRARY [username.ADALIB]
- where 'username' is the name used in the Repository logon
```

Each time you logon to the STARS computer, you must use the "ACS SET LIBRARY" command to define the Ada library.

Once the library has been defined, use the following command to compile:

\$ ADA filename

- where 'filename' is the name of the file to be compiled

Once all the units for a program have been successfully compiled the program must be linked before it can be executed. ACS has its own link command which will invoke the DEC system linker. To link a main program use the command:

\$ ACS LINK main_procedure_name

This will produce an executable file of filetype EXE.

To run the executable, type:

\$ RUN main_procedure_name

The DEC Ada compiler and the VAX operating system have complete facilities for program debugging and performance analysis. Describing these facilities is beyond the scope of this document.

APPENDIX B.

APPENDIX: Help For New DEC Notes Users

This capability of the Repository is provides for open discussion on relevant technical topics. The VAX Notes product from DEC supports this capability and it may be called the "FORUM" in other contexts on the repository.

An individual subject is called a CONFERENCE in the nomenclature of VAX Notes and a FORUM in the Repository. Each FORUM (or CONFERENCE) has any number of TOPICS, each of which may have any number of REPLYs. The combination of a TOPIC and its REPLYs is called a DISCUSSION. The terminology of TOPIC, REPLY, and DISCUSSION is the same in DEC Notes and the Repository.

NOTE: The Notes product is dependent on proper emulation of a DEC VT100 or VT220 terminal. If problems with the product screen display are observed, exit Notes and issue the command `SET TERM/INQUIRE{Return}` followed by the command `SHOW TERM{Return}` . The first command will ensure that the VAX computer knows what kind of terminal (or emulator) is use, the second command will display the terminal characteristics determined by the first. The terminal type is displayed in the first line resulting from the "SHOW TERM" after the text "Device_Type:", if the text is not "VT100" or "VT200_Series", the VAX notes product (and many others) will not work.

Execute VAX Notes by selecting the FORUM option from a menu or by entering `NOTES{Return}` at the DCL prompt. The NOTES prompt ('NOTES>') is displayed. To exit NOTES, type `EXIT{Return}` ". To view all currently available FORUMS, type:

`DIR/CONF`

In order for you to view a specific FORUM, it must be listed within your NOTEBOOK (the list of your specific subjects of interest). To register a FORUM in your NOTEBOOK, type:

`ADD ENTRY forum_name`

Once a FORUM has been entered in your NOTEBOOK, it remains until you delete the entry.

In order to view the active DISCUSSIONS of a specific FORUM, type:

`OPEN forum_name`
`DIR`

Type the TOPIC number to access the DISCUSSION of interest. To go from a TOPIC to its REPLYs, enter `{Return}` . Each TOPIC is identified by a whole number; related REPLYs are identified by the TOPIC number followed by a decimal followed by the REPLY number. You can reread a TOPIC or REPLY by typing its number at the NOTES prompt. To return to the list of TOPICS, type "DIR". To return to the list of FORUMs in your NOTEBOOK, type 'EXIT'.

For further information, enter "HELP" at the NOTES prompt.

APPENDIX C.

APPENDIX: Using KERMIT to Transfer Files

Files may be exchanged between the VAX computer and personal computers using software which supports the KERMIT protocol for file transfer. The following example assumes that the user is using PROCOMM on a PC compatible and has already logged on the STARS computer with the recommended terminal settings.

NOTE: There are file names that are permitted on a PC that are not permitted on the VAX and vice versa. For information on specification of VMS files use the help available with the command **HELP SPECIFY FILE**.

C.1 UPLOAD A FILE (PC TO VAX)

```
At the VMS prompt type      "Kermit<return>"  
At the KERMIT prompt type "Server <return>"  
Hit PgUp Key on the the PC keyboard to upload a file.  
Type "2" to select the KERMIT protocol for the transfer.  
The PC will prompt for the name of the file to be sent to the VAX.  
Type the Filename followed by a <return>  
  -- type in filename you wish to send.  If the filename has no  
      extension, then you must put a period after filename.  
      example: "a:foo.bar"  
  
PROCOMM will now send your document to the VAX using the KERMIT  
file exchange protocol. PROCOMM will beep several times on  
completion  
At the VMS prompt type "exit<return>"
```

You may use the DIR or TYPE command to see that the files was transferred.

C.2 DOWNLOAD A FILE (VAX TO PC)

```
At the VMS prompt type      "Kermit<return>"  
At the KERMIT prompt type "send 'filename'<return>"  
  -- replace 'filename' with the name of the file to be transferred.  
      Wildcard characters (?) and (*) are accepted.  
Hit the PgDn Key on the the PC keyboard to download a file.  
Type "2" to select the KERMIT protocol for the transfer.  
  -- The file will be placed in a directory on the PC which has been  
      changed in the menu available with the ALT-S command on the  
      PC and under the "General Setup" submenu.  
At the VMS prompt type "exit<return>"
```

APPENDIX D.

APPENDIX: Using the MAIL Facility

D.1 Introduction

The Personal Mail Utility (MAIL) can be used to send mail to other users on your system or any other computer connected to your system via network hardware and software. This utility also allows you to FILE , FORWARD , DELETE , PRINT , and REPLY to messages that other users send to you.

When MAIL sends you a message from another user while you are logged in, MAIL notifies you. You will also be notified that you have new mail when you log in and when you invoke the MAIL utility.

Messages that you receive are stored in message files. The first time that you receive mail, a message file called MAIL.MAI is created in your MAIL directory. Large MAIL messages are placed in .MAI files in your MAIL directory (MAIL followed by a hex identification code to distinguish between messages).

D.2 Command Summary

Following is a summary of MAIL commands:

Command	Description
BACK	Backs up to previous message.
COPY FOLDERNAME Filename	Copies a message to another folder without deleting it from the current folder.
DELETE [msg-number]	Deletes current (last-read) message or designated message. The message is not permanently deleted until you exit from MAIL.
DIRECTORY Foldername	Lists a summary of your mail messages; the name of a message folder can be optionally specified, otherwise, current message folder is displayed.
EXIT	Exits from MAIL, deleting any messages marked for deletion.
EXTRACT File-spec	Places a copy of the current message into the specified sequential file.
FILE	Copies current (last-read) message into another folder; deletes it from current folder.
FORWARD	Sends a copy of current (last-read) message to specified user(s).
HELP	Displays information on using MAIL.
NEXT	Skips to and displays next mail message.
PRINT	Queues the current (last-read) message for printing. Messages do not print until you exit the MAIL utility.
QUIT	Exits from MAIL and cancels any previous

	message deletions, thus leaving the message file intact.
READ Foldername [msg-number]	Displays next page of message or the next message. Entering {return} performs the same function.
REPLY File-spec	Sends a reply to the sender of the current (last read) message. You can include a file.
SEARCH Search-string	Searches for a message that contains the specified text string.
SELECT Foldername	Moves from one folder to another within your mail.
SEND filename [/NOEDIT]	Sends a message to a user or users. The message can optionally be a file specified by filename. SEND defaults to using the editor to compose the message or edit the specified file. This message is composed using the EDT Editor or an editor you specify using the logical name MAIL\$EDIT. The /NOEDIT qualifier prevents the system from using the editor.
SET FILE Filename	Opens the file specified by filename as the current mail file.
SET FOLDER Foldername	Moves from one folder to another.
SET FORWARD Address	Sets the forwarding address for your mail.
SET MAIL [.subdirectory]	Specifies all current mail folders and new mail be moved to specified subdirectory.
SET PERSONAL NAME "Text String"	Enables you to append the specified text string to the end of the "From:" field of your mail messages you send.
SET WASTEBASKET NAME folder-name	Enables you to change the name of your waste basket folder.
SHOW MAIL	Displays detailed information about the state of mail.
SHOW PARAMETER	Displays information about the parameter that was established by one of the previous set commands.

D.3 Examples Using VMS MAIL

The following examples illustrate the use of the mail utility for common applications.

User SMITHJ invokes the MAIL utility, reads his two messages, and decides to delete the second message. (The second message will not be permanently deleted until SMITHJ uses the EXIT command, or reads a new MAIL file. Use the QUIT command if you delete a message accidentally and wish to recover it.

```
$ MAIL
You have 2 new messages.
MAIL>READ
Mail 1
From: DOE           23-JUL-1985 11:00
To: SMITHJ
Subj: Cancellation of Friday's Staff Meeting
Friday's staff meeting was canceled. Will be rescheduled next week.
John

MAIL>READ
Mail 2
From: LEE           23-JUL-1985 11:15
To: SMITHJ
Subj: Revised Project Plan
The revised project plan that you requested will be forwarded
to you in two days.
Bill
MAIL> DELETE
```

SMITHJ decides to send a message to DOE, and exit from the MAIL utility. Mail by default uses the EDITOR. To turn the EDITOR off, type SEND/NOEDIT at the MAIL prompt.

```
MAIL> SEND/NOEDIT
To: DOE
Subj: Good News
Enter your message below. Press CTRL/Z when complete. Use CTRL/C to quit:
It's a good thing that the meeting was canceled. Bill says
the new project plan will be ready in a couple of days.
I will talk to you later about the changes in the plan.
See me when you have time.
Jim

CTRL/Z
MAIL> EXIT
```

SMITHJ decides to send a message to DOE on the EAGLE VAX, then exit from the MAIL utility.

```
MAIL> SEND/NOEDIT
To: EAGLE::DOE
Subj: Meeting at 14:00
Enter your message below. Press CTRL/Z when complete. Use CTRL/C to quit:
A meeting has been scheduled for 14:00 to discuss new contracts.
Let me know if you cannot make it.
Jim

CTRL/Z
MAIL> EXIT
```

SMITHJ decides to send a message to user DOE at the DDN computer site SRI-KL. To send the message through Network, specify the network mail processor. Do this by using an address of the format: network%"username@host". DOE@SRI-KL is the DDN (or Internet) address of the recipient.

```
MAIL> SEND/NOEDIT
To: ARPA%"DOE@SRI-KL"
Subj: I would like to get a copy of your new paper
Enter your message below. Press CTRL/Z when complete. Use CTRL/C to quit:
I have just finished my latest changes on our paper. I will
be sending you a copy through the electronic mail later today.
Please let me know what you think about the new changes.
```

```
Jim Smith
DDN Addresses:
SMITHJ@WPAFB-AAMRL.ARPA
@WPAFB-AAMRL.ARPA:SMITHJ@STARS
CTRL/Z
MAIL> EXIT
```

SMITHJ decides to send the file SAMPLE.TXT to user DOE at the DDN computer site BAFB-DDNVAX. The message is sent through network mail processor.

```
MAIL> SEND/NOEDIT SAMPLE.TXT
To: ARPA%"DOE@SRI-KL"
Subj: Here is that copy of SAMPLE.TXT
MAIL> EXIT
```

SMITH decides to reply to a message that he just read. The system automatically uses the subject of the original message as the subject of this message, but adds RE: to the beginning.

```
MAIL> REPLY/NOEDIT
Subj: RE: Rough draft of proposal
Enter your message below. Press CTRL/Z when complete. Use CTRL/C to quit:
I've just read your message. I'll get back to you later.
Jim Smith
CTRL/Z
MAIL> EXIT
```

D.4 Distribution Lists

The MAIL program allows you to use distribution lists to send messages to groups of people. A distribution list is a file containing the MAIL address (local or using the network) of each person to whom you wish to send the message. For example, if you send copies of rough drafts of a paper to five people every time, you can create a file DRAFT.DIS that contains the address of those five people.

Create your distribution list using an editor. Access it by catenating "@" and the file name. In the next example, SMITHJ decides to send copies of the file DRAFT.DOC to everyone in the distribution list REVIEW_TEAM.DIS.

```
MAIL> SEND/NOEDIT DRAFT.DOC
To: @REVIEW_TEAM
Subj: Here is first draft of SAMPLE.TXT
CTRL/Z
MAIL> EXIT
```

Note that the .DIS file extension was not used. Distribution lists default to using the .DIS file extension. If you do not use .DIS then you must specify the file extension. The file must also reside in the current default directory or you must specify the directory name as well as the file name.

APPENDIX E.

APPENDIX: AdaMat

AdaMAT is an automated quality-reporting tool, which bases its scores on a hierarchical framework of metrics. It is possible to use a single command to retrieve a detailed report containing all the information AdaMAT will provide, as well as a series of commands to tailor a report to your needs.

To use AdaMAT, you must create a sub-directory in your account for Adamat to use in storing intermediate files during an analysis. You must then SET that directory to serve as your AdaMAT library, either in your LOGIN.COM, or interactively each time you want to use AdaMAT. If your account name is "SMITHJ", and the directory you create for AdaMAT is a sub-directory of your main directory called "[.AdaMatlib]", then the command to set the library should read:

```
adllib set disk$user:[SMITHJ.AdaMatlib]
```

If you want to put that in your login.com file, you must precede the command with a "\$" (i.e., "\$ adllib set disk\$user:[SMITHJ.AdaMatlib]").

To use AdaMat after setting up the library, the command is adamatall, and it can be followed by from one to six filenames, separated by spaces.

```
example : Adamatall file1 file2 file3 (where the extensions are .ada)
```

With a single filename, you get a report on the contents of that file. With multiple filenames, you will be prompted for whether you want a comparison of the files, a combined analysis of all of them, or both.

NOTE: All source filenames **MUST** have extension ".ada", and you **MUST NOT** include that extension in giving the filename. If you have only one file as the object, then the report will have that filename and the extension ".rep". If you have more than one, you will be asked to give a filename (without extension). During analysis of a file, AdaMAT will calculate the number of lines, statements, and comments in the file. This will be displayed on the screen, but will **NOT** be placed in the report.

Further information should be obtained from the AdaMat documentation.

APPENDIX F.

APPENDIX: Help for VMS NEWS Users

F.1 Introduction

News is a computer-based conferencing system. It is similar to the electronic mail system (E-mail). VMS NEWS allows the user to view all postings made by other users of NEWS and also allows the user to contribute to the conference by posting an item into NEWS. News items are classified by newsgroups (postings with similar subject matter) and all postings referring to the same conference are logically grouped together for presentation within a newsgroup.

Unlike person-to-person mail, all items posted into NEWS are readable by ALL users on the system, so the items in NEWS are intended for general view.

Typically, the local VMS system is linked to a wider network of systems. The local node receives NEWS postings from other nodes on the network and sends local postings through the wider network.

F.2 NEWS Command Summary

Command	Description
DREGISTER [newsgroup]	Removes your registration from a newsgroup. The newsgroup may either be specified as a parameter to the command, or, if not specified, the current newsgroup is deregistered.
DREGISTER/ALL DIRECTORY	Removes registration tags from all newsgroups. In screen mode: moves between newsgroup and newsitem displays and selects a subset of the full newsgroup set to display on the screen. In line mode: by default lists all the news items in the currently selected newsgroup, on a page by page basis, displaying the item number, creation date, and item title.
DIRECTORY/ALL	In screen mode: resets the newsgroup directory to display all newsgroups held on the local system.
DIRECTORY/NEW	In screen mode: sets the newsgroup directory screen to only display those newsgroups in which you are registered with newitems you have not read.
DIRECTORY/REGISTER	In screen mode: sets the newsgroup directory screen to only display those newsgroups in which you are registered.
DIRECTORY/SINCE=date	In screen mode: sets the newsgroup directory screen to display only those newsgroups in which new items have been entered since the date specified. The date is given in VMS time format: e.g., DIR/SINCE=22-FEB.
DIRECTORY/ITEMS	Opens the 'current' newsgroup and displays the newsitem for that newsgroup. This command is

DIRECTORY/NEWSGROUPS	equivalent to the basic 'SELECT' command. Moves the context of NEWS to the newsgroup directory screen. This command is equivalent to the 'NEWSGROUP' command.
DIRECTORY/RESET	Clears the internal memory copy of the NEWS database and reads a new copy of the database from the master index files into memory. This command is not normally used -- it is relevant only in those situations where a background process is adding or deleting news items to the database, and the user encounters 'file not found' errors when attempting to access item files.
DOWN [Number]	In screen mode: moves the current pointer down one line. The command has an optional numeric parameter, the number of lines to move down. Default value is 1. This command is bound to the down arrow key on the terminal. The command 'DOWN 18' is bound to the 'next screen' key in the terminal.
EXIT	Exits from NEWS. Ctrl-Z is also interpreted as EXIT. On exit from NEWS, a new register file is written out to SYSS\$LOGIN. This file, (SYSS\$LOGIN:NEWS_GROUPS.REGISTER) contains the list of registered newsgroups, read/unread newsitems, the marked item list and the kill filter lines. The context file is used to determine which news items are unread and is also used to re-establish context on the next invocation of NEWS -- The next invocation of NEWS restores the screen displays to the state at which the 'EXIT' command was entered. On exit the user is prompted for the print queue name if printer requests were generated during this NEWS session. Copies the current news item text into an output file. If the filename is not specified, the user prompted for a name (default value is SYSS\$LOGIN:NEWS.LIS).
EXTRACT [filename]	Copies the current news item text into an output file. If the filename is not specified, the user prompted for a name (default value is SYSS\$LOGIN:NEWS.LIS).
EXTRACT/ALL	Copies ALL items in the current selected newsgroup into the file.
EXTRACT/APPEND	Appends the output to the nominated file, rather than the default action of creating a new version of the output file.
FOLLOWUP	Used to post a reply to a news item back into NEWS. The followup item will reference the news item you are following up as the parent of the new posting. The editor is invoked to form the new posting, with the edit buffer preloaded with the text of the original item. The editor is user-definable. NEWS will fill in all defaulting news headers and will prompt for all header items which are non-defaulting (the subject line and the news-

FOLLOWUP/HEADERS

groups to post the item into). If the newsgroups for the posting are moderated newsgroups, the posting is automatically re-directed as mail to the moderator address and NOT posted back to NEWS. Followup prompts for the subject of the posting and a list of newsgroups into which to post the item. All other header lines of the news item text will be filled with null values. The /HEADERS qualifier forces prompting for optional components of the item header. These fields are:

Summary: A one line summary of the contents of the posting.

Reply-To: The (internet) mail address for REPLYing to the item - used if replies are to be sent to a mail address OTHER than yourself (as the originator of the item).

Distribution: A (comma separated) list of keywords designed to limit the distribution of a news item to a subset of the network. These keywords are site specific, but commonly include the keywords "local" (do not forward to the net) and "world" (forward as far as possible through the net).

Followup-To: The list of newsgroups where followup postings are to be sent. This is used to move a discussion to another newsgroup.

Keywords: A few relevant, pithy keywords which should indicate to other readers whether the item is of interest.

Invokes VMS MAIL, to send a copy of the current news item to another user (or yourself if so inclined). FORWARD and MAIL are equivalent.

FORWARD

FORWARD/TO=user

FORWARD/TO=(user,user)

Specifies the VMS Mail address of the users to receive the mail (this is one of the anomalies of NEWS that will be addressed in a future version - the addresses used here should be internet-style addresses - not VMS Mail addresses -as is currently the case). This may be a user name or a list of names and may also include a distribution list file specification. If this qualifier is not specified, the user is prompted for the /TO value.

FORWARD/SUBJECT=subj

FORWARD/SUBJECT="text - string"

FORWARD/NOEDIT

Specifies the subject of the message for the heading. If not specified, the user is prompted for the /SUBJECT value.

By default, invokes the editor to allow the item text to be edited before mailing the item.

FORWARD/SELF	This qualifier sends the news text to the mailer without modification. The editor is user definable.
FORWARD/HEADERS	Sends a copy of the message back to yourself. By default the news item header lines are stripped off the item text before it is mailed. This qualifier loads the item header lines into the mail buffer as well as the body of the text.
HELP	Invokes the HELP processor; can be used with parameters to specify the command for which HELP is wanted.
KILL	Allows the user to filter out all messages of a particular class - the READ/NEW command will mark such filtered items as having been read without displaying the text of the item to the user and will search forward for the next unread item. The KILL filter works on three attributes for a match: the newsgroup name, the subject line and the sender's address. Of these attributes, only one of the subject line and sender need be specified. Thus, it is possible to filter all postings by a particular sender in all newsgroups or filter a conversation stream from a particular newsgroup or filter all postings from a particular sender within a specified conversation stream. The KILL command adds entries to the kill filter list. Removing kill filters must be done manually by editing these kill entries: they are stored in the file SYSS\$LOGIN:NEWS_GROUPS.REGISTER in the following format: news context entries MARKLIST mark entries KILLLIST newsgroup S:subject F:from line To remove an entry, delete the relevant line from this file using a text editor. Add the current item's From: address to the kill filter set. The command will then prompt for the set of newsgroups to which this filter will be applied. The default value is the current newsgroup; more newsgroups may be specified using wildcard notation ('*') or a list of newsgroups. Adds the current item's Subject line to the kill filter set. Used to filter out unwanted messages. FORWARD and MAIL are equivalent.
KILL/FROM	Places a mark against the current newssitem. This item can be selected at a later time by the READ/MARK or SELECT/MARK commands. If no tag value is specified then the default tag, "mark" is used. Any tag value may be specified - tag values
KILL/SUBJECT	
MAIL	
MARK [tag]	

NEWSGROUPS are words (no space characters) of any length under 80 characters.

NOSCREEN In screen mode: pops the display stack back to the newsgroup directory screen from the newsitem or news text display screens. Synonym of the 'DIR/NEWSGROUPS' command.

POST [Filename] Turns off screen mode and enters line command mode. Posts a new newsitem into NEWS. By default, the editor is invoked to form the new posting. NEWS will fill in all defaulting news headers and will prompt for all header items which are non-defaulting (the subject line and the newsgroups to post the item into). If the newsgroups for the posting are moderated newsgroups, the posting is automatically re-directed as mail to the moderator address and NOT posted directly to NEWS. If a filename is specified, the editor is loaded with the text of the specified file; otherwise, the editor creates a new file.

POST/NOEDIT Bypasses the call to the editor in forming a new item to post. If no post filename is specified, the editor call is forced.

POST/HEADERS POST normally prompts for the subject of the posting and a list of newsgroups into which to post the item. All other header lines of the newsitem text will be filled with null values. The /HEADERS qualifier forces prompting for optional components of the item header. These fields are:

Summary: A one line summary of the contents of the posting.

Reply-To: The (internet) mail address for REPLYing to the item - used if replies are to be sent to a mail address OTHER than yourself (as the originator of the item).

Distribution: A (comma separated) list of keywords words designed to limit the distribution of a news item to a subset of the network. These keywords are site specific, but commonly include the keywords "local" (do not forward to the net) and "world" (forward as far as possible through the net).

Followup-To: The list of newsgroups where followup postings are to be sent. This is used to move a discussion to another newsgroup.

Keywords: A few relevant, pithy keywords which should indicate to other readers whether the item is of interest.

POST/NEWSGROUPS=[news-] Specifies the list of newsgroups to receive the

group-list}

posting. If this qualifier value is not specified, the user is prompted for the newsgroups. The list is a comma separated list of newsgroup names.

POST/SUBJECT="text string" Specifies the subject of the message for the heading. If not specified, the user is prompted for the /SUBJECT value.

PRINT Appends the current news item to a temporary print file. As each item is PRINTed, it is appended to this print file. At the end of the NEWS run, the user is prompted for the name of the queue to which the output is to be sent. The temporary print file is deleted once the print job is complete.

PRINT/ALL Copies ALL of the items in the current selected newsgroup into the file.

QUIT Exits from NEWS without updating the user's news register file. Thus, no changes are made to the set of unread items, nor are any changes made to the set of marked news items (this is a more graceful means of Ctrl-C or Ctrl-Y!).

READ Reads the next item from the current selected newsgroup and displays the item on the screen page-by-page. The actions of READ can be modified by giving a Newsitem number, which will display that item.

READ/HEADER Normally NEWS suppresses the display of all network routing headers. This qualifier produces a full display of the item contents including mail header lines.

READ/NEW Displays the next unread newsitem from the set of registered newsgroups; may cause an implicit SELECT of a different newsgroup to obtain the next unread item.

READ/EDIT Uses an editor in read-only mode to view the newsitem. This is useful when it is necessary to scroll through the item text or extract a part of the text into a file.

READ/NEXT Skips the remainder of the current newsitem and displays the next item.

READ/LAST Skips the remainder of the current newsitem and displays the previous item.

READ/BACK Equivalent to the /LAST qualifier.

READ/PARENT NEWS items may reference a previous posted item. In such a case the text of the item begins:
"In article {<identifier>}, {username} writes:"
When a news item references previous items, the header includes the identifier of the parent item. READ/PARENT will display the parent item referenced by the current item.

READ/IDENTIFIER=id All NEWS items are identified by a unique message identification string. (This identifier can be displayed using the READ/HEADER command, and

	noting the "Message-Id: ..." line). An item to be displayed can be selected by providing the identifier of the item. e.g.: READ/IDENTIFIER=<243@csc.anu.oz>
READ/MARK=tag	Displays the text of the NEXT newsitem marked with the specified tag value. If no tag value is specified, then the next item marked with any tag is used.
READ/FOLLOWUP	Scans the current newsgroup for the next newsitem with a subject field which matches that of the current newsitem subject (within the current newsgroup); permits viewing of the responses (if any) to the current newsitem.
READ/PREV	NEWS maintains a history of the last 10 items read. READ/PREV pops the most recent item index off this history stack and displays the item. Repeated calls to READ/PREV will continue to pop the stack until the history stack is emptied. In screen mode: repaints the screen. By default bound to the Ctrl-W key.
REFRESH	
REGISTER [Newsgroup-name]	Adds newsgroups to the user's register file. Registering to a newsgroup implies that NEWS will automatically keep track of which items in the newsgroup have been read, so the user can view only the unread news items with repeated READ/NEW commands. The newsgroup-name parameter specifies the name of the newsgroup to register. If the parameter is not specified, the current newsgroup is added to the register file.
REPLY	Posts a MAIL reply directly to the sender of a newsitem; used to respond directly to the poster of an item without the item appearing on the net. NEWS will pre-load the edit buffer with the text of the item to which the reply is being sent, then invoke the editor.
REPLY/HEADERS	By default, newsitem headers are stripped from the item text before it is mailed. This qualifier loads the item header lines into the mail buffer along with the body of the text.
REPLY/SUBJECT=subj	Specifies the subject header of the mail reply. If not specified, NEWS will prompt for a "Subject:" field for the mail.
REPLY/SELF	Forwards a copy of the outgoing mail item back to the sender.
SEARCH [target string]	Directs NEWS to locate a newsitem containing a specified text string. The next item containing the text string is displayed on the screen. Repeated calls to SEARCH (without specifying a text string) will locate successive occurrences in other news items that are in the specified newsgroups. If no target string is specified, the search is resumed using the previous target

string. The search is usually case-insensitive, but this may be reversed (made case-sensitive) by specifying a mixed-case string (i.e., upper case only and lower case only target strings are case-insensitive). To specify a mixed-case string you must enclose the string in " characters (e.g. SEARCH "String"). Since this action involves examining the contents of all specified item files, this command may take a long time to execute. The search may be interrupted by pressing the RETURN key. This will call up a NEWS input prompt, and the search may either be resumed (with another RETURN) or a new command may be given.

By default, Search is limited to the current newsgroup. This can be modified by specifying the newsgroups which should be searched. The wildcard character ('*') may be used to include a set of newsgroups. A number of newsgroups may be specified with the usual list notation (comma separated list).

SEARCH/NEWSGROUPS=news-groups

SEARCH/EDIT

SEARCH/HEADER

SEARCH/NODISPLAY

SCREEN

SELECT newsgroup

SELECT/NEW

SELECT/MARK=tag

SHOW KILL

SHOW MARK [tag]

Uses an editor in read-only mode to view the newsitem. This is useful when it is required to scroll through the item text or extract a part of the text into a file.

Normally NEWS suppresses the display of all network routing headers. This qualifier produces a full display of the item contents including mail header lines.

Positions the screen directory to the item containing the the target string, but does not display the item text.

Enters NEWS screen display mode (the default mode). This command is normally given after a NOSCREEN command.

Changes newsgroup context to the nominated newsgroup. If no newsgroup is given, selects the current newsgroup. Otherwise, the specified newsgroup is opened.

Selects the next registered newsgroup containing unread newsitems. If the current newsgroup contains unread items, no action is performed.

Moves the current item pointer to the NEXT newsitem marked with the specified tag value. If no tag value is specified, the next item marked with any tag is used.

Displays the current KILL filter set.

Displays a listing of the set of marked newsitems. If no tag value is specified, all mark tag values are displayed. If a tag is used, only those tag values which match using wildcard matching are displayed.

SKIP	Marks individual newsitems or all newsitems within a newsgroup as having been read by the user. If the current display is the newsitem directory, SKIP marks the 'current' newsitem as read and advances the newsitem pointer to the next newsitem. If the current display is the newsgroup directory or the /NEWSGROUP qualifier is specified,
SKIP/ALL	then ALL newsitems within the 'current' newsgroup are marked as having been read.
SKIP/BEFORE=date	Mark ALL news items in ALL newsgroups as having been read by the user. Marks all items in the current newsgroup which were created on the local system before the date specified as having been viewed by the user. May also be used with the /ALL qualifier to mark all items in all newsgroups created prior to the specified date, as having been viewed. The date format is the standard VMS date-time format; e.g. SKIP/BEFORE=22-FEB. "TODAY" and "YESTERDAY" are accepted as valid date strings.
SKIP/FOLLOWUP	Marks as read all newsitems in the current newsgroup with a subject field matching the current newsitem; used to skip entire conversation streams: all newsitems with related subject fields will be marked as having been read.
SKIP/NEWSGROUP	Marks ALL items in the current newsgroup as read. If the current display is the newsgroup directory, /NEWSGROUP is the default action - if the current display is the newsitem directory, /NONEWSGROUP is the default action, and only the current item is marked,
SPAWN	Spawns a DCL level subprocess from NEWS (using LIB\$SPAWN). LOGOUT from the subprocess returns to NEWS.
UNMARK [tag]	Clears the mark from the current newsitem. If a tag is specified, only those tag values are be cleared. If no tag is specified, all tags are removed from the item. The tag may be specified using wildcard characters.
UNREAD	Marks the current item as UNREAD; allows the item to be displayed at a later time by READ/NEW.
UP [Number]	In screen mode: moves the cursor up one line. This command is bound to the up arrow key on the terminal, and the command "UP 18" is bound to the PREV SCREEN key.
VERSION	Displays the software version and creation date of the local NEWS software.

APPENDIX G.

APPENDIX: Standard Generalized Markup Language

The STARS computer supports two Standard Generalized Markup Language (SGML, ISO 8879:1986) processors, the STARS Foundations software and the Datalogics commercial SGML parser called ParseStation. The STARS Foundations SGML software was developed in 1988 under a contract with the Naval Research Laboratories and is known as the SGML Text Composition System (STCS). STCS does not fully implement the SGML standard and suffers from slow execution, but it does support the processing of an SGML document through printing on ASCII text devices or onto Postscript printers. The Datalogics ParseStation product is a high speed SGML parser that fully conforms to the SGML standard. It does not support any form of formatted output other than a Canonical Test Results file. The use of each described briefly below.

G.1 STCS

The STCS SGML parser is supplied with four DTDs and output programs for each, all files for SGML may be found under the logical name SGML:. The following filename extensions are used in the STCS software:

.DTD	Suggested extension for SGML Document Type Definitions (DTD)
.BNS	Output file extension from the DTD to BNF translator program DTDTOBNF which must be used to make a new DTD available to parser program named SGML
.SGM	Suggested extension for source files with SGML markup
.CDC	Output file extension from the SGML parser, the file is called a composition document.
.PS	Output file extension from a TCS document formatting application designed for a particular DTD and linked for Postscript output
.TXT	Output file extension from a TCS document formatting application designed for a particular DTD and linked for text file output

The STCS software has three DTDs developed for it, the Report, the Memo, and the Letter. A DTD for a Briefing has been prepared by task IR65. The following commands are recognized in support of STCS SGML, each takes a single argument of its input filename:

STCS	Used to process an STCS document from SGML to the proper formatting program for either REPORT, MEMO, LETTER or BRIEFING. This procedure runs the SGML parser to produce a Composition Document and then runs the appropriate TCS program to produce the formatted Postscript output file. This command queues the output to be printed on a local printer and renames the Postscript output file to the name of the input file with an extension of ".PS". STCS will print a short help message if no filename is given.
------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

SGML	Processes an input file to a composition document for input to the correct document formatting program. The output from this program is a file with the input filename and the extension ".CDC"
DTDTOBNF	Reads a DTD file and prepares an intermediate form of the DTD for use by SGML. This process has been done for the REPORT, MEMO, LETTER, and BRIEFING. The output file will have the extension ".BNS"
REPORT	Report TCS program which outputs a Postscript file with the name REPORT_OUTPUT.PS
REPORTA	Report TCS program which outputs an ASCII Text file with the name REPORT_OUTPUT.TXT
LETTER	Letter TCS program which outputs a Postscript file with the name LETTER_OUTPUT.PS
LETTERA	Letter TCS program which outputs an ASCII Text file with the name LETTER_OUTPUT.TXT
MEMO	Memo TCS program which outputs a Postscript file with the name MEMO_OUTPUT.PS
MEMOA	Memo TCS program which outputs an ASCII Text file with the name REPORT_OUTPUT.
BRIEFING	Briefing TCS program which outputs a Postscript file with the name BRIEFING_OUTPUT.PS

When using the STCS software, each source instance file to the parser must start with a document type declaration of the form:

```
<!doctype report>

-- or --

<!DOCTYPE report[
  <!entity mo cdata "<">
  <!entity mc cdata ">">
  <!entity me cdata "</>">
]>
```

The second example shows the use of entity declarations in a document instance. Use of the STCS software is shown below to produce the Postscript and text formatted output of the file mydoc.sgm prepared using the Report DTD.

```
$ SGML mydoc.sgm

SGML SYSTEM -- Version 1.2.4
Science Applications International Corporation (SAIC)
Use limited to U.S. Gov't agencies and contractors.
Developed Under Naval Research Laboratory Contract No. N00014-87-C-2386
```

Developed Under Contract No. F19628-88-D-0032 for USAF ESD, Hanscom AFB

```
Initializing parser
Processing BNS document
Processing source document
SGML processing complete
$ REPORT mydoc.cdc
```

```
Text Composition System -- Version 1.2.4
Science Applications International Corporation (SAIC)
Use limited to U.S. Gov't agencies and contractors.
Developed Under Naval Research Laboratory Contract No. N00014-87-C-2386
Developed Under Contract No. F19628-88-D-0032 for USAF ESD, Hanscom AFB
```

```
$ rename report_output.ps mydoc.ps
$ print/param=data_type=postscript mydoc.ps
$ REPORTA mydoc.cdc
```

```
Text Composition System -- Version 1.2.4
Science Applications International Corporation (SAIC)
Use limited to U.S. Gov't agencies and contractors.
Developed Under Naval Research Laboratory Contract No. N00014-87-C-2386
Developed Under Contract No. F19628-88-D-0032 for USAF ESD, Hanscom AFB
```

```
$ rename report_output.txt mydoc.txt
$ print mydoc.txt
$ delete mydoc.cdc;
```

G.2 DataLogics ParseStation

ParseStation consists of three products: an SGML Declarations Parser (SP), a DTD Parser (DP), and a Document Instance Parser (IP). The only output from the Datalogics parser is a log file and an optional Canonical Test Results file, no formatted output is available. Unlike the STCS software described above, a source instance file for the Datalogics parser must not have a Document Type Declaration preceding the markup source. The steps to process a source instance to a DTD using the Datalogics parser are described below.

NOTE: The Datalogics products SP, DP, and IP will display a help message when executed with no parameters. At this time the help messages are corrupted by "garbage" characters. Datalogics has not yet addressed this problem though they have been notified that it exists. It is due, they say, to the special version they prepared to run under VMS 4.7.

An SGML Declarations file must be processed to inform the parser of the coding scheme (syntax) used in the preparation of the SGML document. A sample file is available which implements the reference concrete syntax, as used for basic SGML documents and with the STCS parser. The SGML Declaration parser is used as follows:

```
$ SP report.sds
```

SGML Declaration Parser

```
Version 4.7b
Copyright (c) Datalogics 1989, 1990
    An SGML Program Conforming to
    International Standard ISO 8879
    Standard Generalized Markup Language

Parsing SGML Declarations File 'report.sds'.

Closing Statistics:
    Output File: 'report.sdo'.
    Bytes used for string space: 131.
    Bytes used for control blocks: 1952.
SGML Declarations Parser Completed Successfully.

SGML Declarations Parser Exit Code: 0.
$ _
```

The DTD must be processed by the DTD Parser, as show below:

```
$ DP report.dtd

SGML Document Type Definition Parser
    Version 2.9b
Copyright (c) Datalogics 1988, 1989, 1990
    An SGML Program Conforming to
    International Standard ISO 8879
    Standard Generalized Markup Language

Log File: 'report.log'
SDO File: 'report.sdo'
Namecase General is True.
Namecase Entity is False.
Parsing DTD File: 'report.dtd'
Parsing DOCTYPE REPORT
```

This DTD Conforms to the ISO 8879 Standard

DTO File 'report.dto' Created

```
Closing Statistics:
    Capacity Points: 560
    Bytes of DTO File String Space: 397
    SGML Descriptor Blocks: 164
```

Document Type Definition Compliant and Parsed Normally.

```
Program Status Code: 0.
$ _
```

A Job File file must be prepared. The job file will have four lines as shown below, each line tells the instance parser where to find a file it needs. Using the file names that have been processed with the above commands, the job file will look like:

Column	
0	1 2
123456789012345678901234567890	
DTD	report.dtd <<<< DTD file name
DTO	report.dto <<<< output file name from DP (above)
SDS	report.sds <<<< input file name from SP (above)
SDO	report.sdo <<<< output file name from SP (above)

Process a source instance file prepared with SGML markup for the DTD referenced in the above Job File. The source instance must not contain a declaration statement and must be prepared in the syntax specified by the SGML Declaration file.

```
$ IP doc.sgm
```

```
SGML Document Instance Parser
Version 2.9b
Copyright (c) Datalogics 1987, 1988, 1989
An SGML System Conforming to
International Standard ISO 8879
Standard Generalized Markup Language
IPA0112:
*****
Program messages will be written to:
  doc.log
*****
Reading File 'report.jbf', File Type 'JOB FILE'.
Loading Data Structures From DTO File 'report.dto'.
SDO File: 'report.sdo'

Concrete Syntax Settings In Effect For This Parse:
  NAMECASE GENERAL: YES.
  NAMECASE ENTITY: NO.
  NAMELEN: 8.
  SHORTTAG: NO.
Closed 'report.jbf', File Type 'JOB FILE'.
Reading File 'doc.sgm', File Type 'DIRECT INPUT FILE'.
Closed 'doc.sgm', File Type 'DIRECT INPUT FILE'.
Document Parsed Successfully, No Errors or Warnings.

Instance Parser Exit Status: 0.
$ _
```

APPENDIX H.

APPENDIX: STARS Account Request Form

STARS User Account Request Form

Name: _____

Organization: _____

Address: _____

Address: _____

City/State/Zip: _____

Phone: _____

FAX: _____

Network: _____

Check affiliation if subcontractor : IBM Boeing Unisys

For our records, what kind of equipment will be used for accessing the repository?

Mail To:

Science Applications International Corporation
Ada Software Division
311 Park Place Blvd.
Suite 360
Clearwater, Florida, 34619

Or FAX to (813) 797-3187

For SAIC Use Only

Username : _____ Group _____

IBM Approval : by _____ date _____

User Notified : by _____ date _____

Database Entry: by _____ date _____